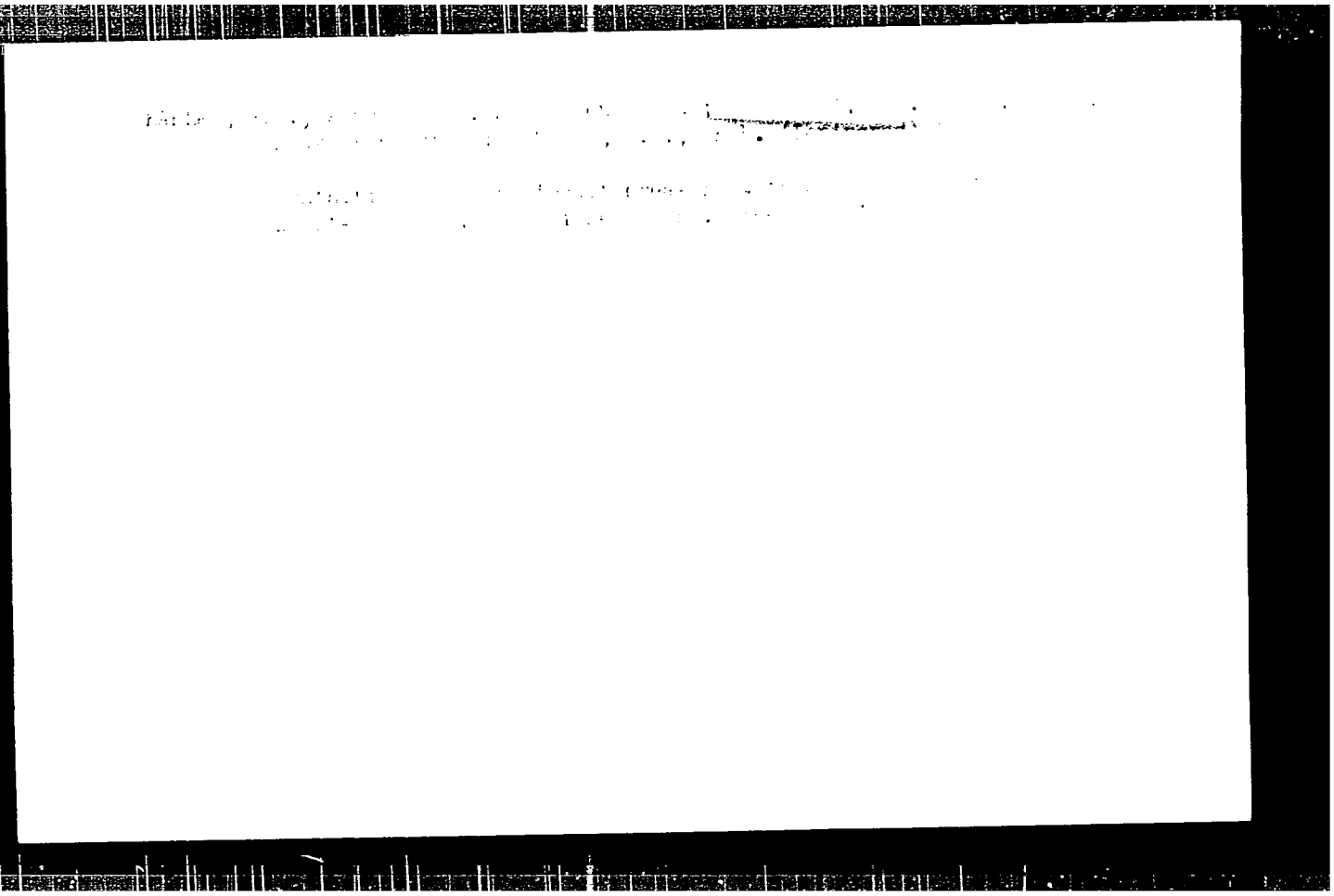
IVANOV, V.L.; IVATSIK, Ye.Ye.; NASHATYR', V.M.; PIRYAZEVA, A.I.; SADOVSKIY, Yu.D.

Installation for combined testing of valve dischargers. Trudy LPI no.195:511-522 '58. (MIRA 11:10)
(Electric discharges)



8(2)

AUTHORS: Ivanov, V. L., Engineer, Nashatyr', L. M., SOV/105-59-7-16/30
Candidate of Technical Sciences, Polovoy, I. F., Candidate of Technical Sciences

TITLE: Some Problems of the Method of Testing High-voltage Insulation (Nekotoryye voprosy metodiki ispytaniy vysokovol'tnoy izolyatsii)

PERIODICAL: Elektrichestvo, 1959, Nr 7, pp 61 - 64 (USSR)

ABSTRACT: Three circuit diagrams of test devices are described, which were developed at the laboratory for high-voltage engineering imeni Gorev at the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute). Also the results obtained by investigations of their mode of operation are given. Most internal overvoltages, which are characteristic of 110 - 500 kv mains, may be represented with an accuracy that is sufficient for practical use as the sum of voltages of various frequencies and amplitudes, among them also of direct voltages. It is therefore possible to reproduce them by means of circuits which are based on the addition of these components, i.e. on the connection in series of some e.m.f. sources with the object to be investigated. Figure 1 shows the most simple circuit of an apparatus for the investigation of insulation in the case of internal overvoltages. The device is

described. Such a circuit is difficult to construct if high test voltages are required, because for this purpose a reactor with high inductivity for very high voltages and a rectifying device for a high voltage is nedessary. The circuit shown in figure 2 satisfies these conditions. According to this circuit, a test device with 5 oscillatory circuits was built. Figure 5 shows the third wiring diagram, in the case of which capacity, inductivity, and charging device for considerably lower voltages are used than in the circuit shown by figure 2. Therefore, it is possible in this case to select optimum parameters of the oscillatory circuit. However, the test-transformer must be suited for a considerably higher voltage. According to the circuit shown by figure 5, a device with a test transformer was constructed. The corresponding oscillograms for the circuits shown by figures 2 and 5 are given. On the basis of the investigation it was found that the production of circuits for the testing of various types of high-voltage insulation with voltages corresponding to the shape, size, and duration of internal overvoltages in the electric mains, presents no technical difficulties, and requires a comparatively uncomplicated equipment (reactors, condensers, etc). There are 6 figures and 7 references, 4 of which are Soviet.

Some Problems of the Method of Testing High-voltage Insulation SOV/105-59-7-16/30

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. Kalinina
(Leningrad Polytechnic Institute imeni Kalinin)

SUBMITTED: February 10, 1959

Card 3/3

KAPLAN, Veniamin Vul'fovich; MASHATIN, Veniamin Movshevich; KRASNOOCHKOVTSEV, S.A., red.; ZHITNIKOVA, O.S., tekhn.red.

[A.A.Gorev's oscillatory circuit for the testing of high-voltage apparatus] Kolebatel'nyi kontur A.A.Goreva dlia ispytaniia apparatov vysokogo napriazheniia. Moskva, Gos. energ.izd-vo, 1960. 210 p. (MIRA 14:4)
(Electric apparatus and appliances--Testing)

KAPLAN, V.V., kand.tekhn.nauk (Leningrad); NASHATYR', V.M., kand.tekhn.nauk (Leningrad); IVANOV, V.L., insh. (Leningrad)

Statistical method for substantiating the selection of voltage in testing the interrupting capacity of circuit breakers. Elektrichestvo no.2:69-73 F '60. (MIRA 13:5)
(Electric circuit breakers)

KADOMSKAYA, K.P., kand.tekhn.nauk; KAPLAN, V.V., kand.tekhn.nauk;
NASHATYR', V.M., kand.tekhn.nauk; SHCHERBACHEV, O.V., kand.tekhn.nauk

Problem concerning the use of two-way switches with shunting resistances. Elektrichestvo no.8:61-65 Ag '62. (MIRA 15:7)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.
(Electric switchgear)

KAPLAN, V.V., kand.tekhn.nauk; NASHATYR', V.M., kand.tekhn.nauk;
YANCHUS, E.I., inzh.

The LPI stand for testing high-voltage equipment. Vest.elektroprom.
33 no.4:33-39 Ap '62. (MIRA 15:4)
(Electric apparatus and appliances--Testing)

KAPLAN, V.V., kand.tekhn.nauk; NASHATYR', V.M., kand.tekhn.nauk

Standardisation of voltage recovery with commercial frequency during the testing of switches. Vest. elektroprom. 34 no.1: 64-66 Ja '63. (MIRA 16:1)

(Electric switchgear--Testing)

KAPLAN, V.V., kand. tekhn. nauk; NASHATYR', V.M., kand. tekhn. nauk; YANCHUS, E.I., inzh.

Synthetic tests of electric cutouts. Elek. sta. 34 no.5:65-68 My '63. (MIRA 16:7)

(Electric cutouts--Testing)

KAPLAN, V.V., kand.tekhn.nauk; NAZHATYR', V.M., kand.tekhn.nauk

Development of a synthetic method for testing high-voltage apparatus.
Elektrotekhnika 35 no.2:27-30 F '64. (MIRA 17:3)

KAPLAN, V.V., kand. tekhn. nauk; NASHATYR', V.M., kand. tekhn. nauk

Basic criteria for appraising the equivalency of synthetic networks for determining the switching capability of high-voltage apparatus. Elektrichestvo no.5:22-27 My '64. (MIRA 17:6)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.

KAPLAN, V.V., kand.tekhn.nauk (Leningrad); NASHATYR', V.M., [illegible]
(Leningrad)

Methodology for statistical treatment of the results of the investigations of the switching performance of circuit breakers. Elektrichestvo no.11:58-62 N '62.
(MIRA 15:11)

BOGATENKOV, I.M., inzh.; IVATSIK, Ye.Ye., inzh.; KAPLAN, V.V., kand. tekhn. nauk; KOSTENKO, M.V., doktor tekhn. nauk, prof.; NASHATYR', V.M., kand. tekhn. nauk

Network system for combined tests of magnetic-valve dischargers. Izv. vys. ucheb. zav.; energ. 8 no.8:23-28 Ag '65. (MIRA 18:9)

1. Leningradskiy politekhnicheskiy institut im. M.I. Kal'nina. 2. Chlen-korrespondent AN SSSR (for Kostenko). Predstavlena kafedroy tekhniki vysokikh napryazheniy Leningradskogo politekhnicheskogo instituta.

BOGATENKOV, I.M., inzh.; IVATSIK, Ye.Ye., inzh.; KAPLAN, V.V., kand. tekhn. nauk; NASHATYR', V.M., kand. tekhn. nauk

Combined test of magnetic valve-discharges with 6-500 kv. ratings. Elektrotekhnika. 36 no.9:55-57 S '65.
(MIRA 18:9)

KAPLAN, V.V., kand.tekhn.nauk; NASHATYR', V.M., kand.tekhn.nauk; POPOVA, V.A., inzh.

Method for compensating losses in a lead during the formation of plane current impulses in an experimental system. Elektrichestvo no.9:55-59 S '65. (MIRA 18:10)

1. Leningradskiy politekhnicheskiy institut im. Kalinina.

L 27274-66 EWT(1)

ACC NR: AP6016875 SOURCE CODE: UR/0281/65/000/006/0078/0093

AUTHOR: [redacted], I. N. (Leningrad); Kaplan, V. V. (Leningrad); Kortenko, M. V. (Leningrad); [redacted], V. M. (Leningrad); Lenskiy, E. I. (Leningrad) 31 B

ORG: none

TITLE: Testing the commutation capacity of a high voltage apparatus for high-power networks 21

SOURCE: AN SSSR. Izvestiya. Energetika i transport, no. 6, 1965, 78-93

TOPIC TAGS: circuit breaker, electric power transmission, electric inductance, electric capacitance

ABSTRACT: Results are presented from investigations performed using a network mock-up to synthetically test high-voltage circuit breakers and dischargers to be used in 500-1250 kv power networks. The testing of individual spark-damping elements of breakers is statistically justified. A circuit for combined testing of valve dischargers, including a power system which serves as a source of accompanying current, is analyzed. This system provides full correspondence in current and voltage levels, capacitance and inductance to an actual power network, allowing the breakers to be tested with assurance that the test will correspond to actual operating conditions of the breakers after they are installed in power systems. Orig. art. has: 13 figures. [JPRS]

SUB CODE: 09, 10 / SUBM DATE: 05Jun65

Card 1/1 UDC: 621.316.542.064.241.027.3.001.4: 621.316.933.001.4

L 42230-66 EWT(1)/EPF(k)-2 WW/AT

ACC NR: AP6011546 SOURCE CODE: UR/0105/66/000/004/0079/0084

AUTHOR: Kaplan, V. V. (Candidate of technical sciences); Nashatyr', V. M. (Candidate of technical sciences)

ORG: Leningrad Polytechnic Institute (Leningradskiy politekhnicheskiy institut)

TITLE: Using dynamoelectric storages for physics research

SOURCE: Elektrichestvo, no. 4, 1966, 79-84

TOPIC TAGS: physics research, nuclear physics apparatus, shock generator, energy storage, generator / TI-75 generator, TI-100-2 generator

ABSTRACT: Methods of short-time energy storing by means of rotating machines (shock generators) being investigated by the Electric System and High-Voltage Laboratory, LPI, are reviewed in general terms. The machine-type storage can handle much greater energies than a capacitor bank and can be easily built. A synchronous shock generator (TI-75, TI-100-2 Soviet-built) can be used as an energy storage either with a protective reactor in the main circuit or without it (at a correspondingly higher stored energy); a TI-75 generator can develop up to

Card 1/2 UDC: 621

L 42196-66

ACC NR: AP6011546

4.78×10^6 j. A combination machine-and-capacitor storage increases the amount of stored energy to 6 or 8 million joules. In an inductance-storage system, the shock generator is used to supply energy to several inductance coils (multishock operation), and a special circuit is used to sum up the stored energy and to transfer it to the load. The compensation of resistance loss in an inductive load can be performed in various ways: (a) when long (tenths of a sec to a few sec) impulses are required, a high-power d-c source, such as a machine-and-rectifier outfit, is suitable; (b) with an impulse of a few hundredths of sec duration, capacitors can be recommended; (c) in the case of a dynamoelectric shock generator, its third phase can be used for supplying additional energy to cover the resistance loss. Orig. art. has: 6 figures, 26 formulas, and 1 table.

SUB CODE: 18, 09 / SUBM DATE: 10Nov63 / ORIG REF: 001 / OTH REF: 005

Card 2/2 af

[redacted], R.G.; KLIMANOV, P.M.

Revolving belt conveyer. Rats. i izobr. predl. v strel. no.117: 25-26 '55. (Conveying machinery) (MLRA 9:7)

[redacted], V.V., professor, doktor tekhnicheskikh nauk.

Radiation coefficients of flour, dough and bread, and a study of the sources of infrared radiation. Trudy MTIPP 2:211-226 '52. (MLRA 9:2)

(Bread) (Radiation) (Infrared Rays)

NASHEL'SKIY, A.M.

Electrical conductivity of cast stone at high temperatures.
Lit. proizv. no.2(42-43 P '65. (MIRA 18:6)

LIPOVSKIY, I.Ye., inzh.; NASHEL'SKIY, A.M., inzh.

Investigating the mechanical strength of cast stone at high temperatures. Stek. i ker. 22 no.3:5-6 Mr '65. (MIRA 18:10)

1. Donetskiy kamnelliteynyy zavod.

ASHEL'SKIY, A. Ya. Cand Tech Sci -- (diss) "Study of the process of obtaining anti-friction alloys of lead with calcium and sodium by the carbide-heat method." Mos, 19[illegible]. 14 pp (Min of Higher Education USSR. Mos Inst of Nonferrous Metals and Gold im M. I. Kalinin. Chair of "Foundry Production"), 100 copies (KL, [illegible], 103)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001136110011-6"

AUTHOR: Nashel'skiy, A. Ya. SOV/163-58-3-8/49

TITLE: The Production of Lead-Calcium Alloys by the Thermal Carbide Method (Polucheniye svintsovokal'tsiyevykh splavov karbido-termicheskim metodom)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 3, pp 47 - 52 (USSR)

ABSTRACT: The production of the lead-calcium alloy by the thermal carbide method was investigated. The thermal carbide method is based on the principle of the direct interaction between the lead and the calcium carbide according to the following reaction : $3\ Pb + CaC_2 = Pb_3Ca + 2\ C$.

The optimum grain size of calcium carbide, the optimal ratio between the fluxing material and the carbide, and the influence of the temperature and the duration of the reaction were determined for the carbide method. The reaction was carried out under intense mixing with a steel stirrer in open crucibles. The flux consists of $CaCl_2$, finely ground CaC_2 and CaO, as well as of small additions of CaF_2. The optimum ratio between the fluxing material

Card 1/2

The Production of Lead-Calcium Alloys by the Thermal Carbide Method SOV/[illegible]-[illegible]-[illegible]-[illegible]/49

and carbide is 2,3 : 4. At an increase in temperature to above 1000° C the yield of calcium decreases. 850-900°C were found to be the optimum temperature for this reaction. The dependence of the transition of calcium into the alloy on the quantitative ratio between the fluxing material and carbide was investigated. The influence of the composition of the fluxing material, especially if there are NaCl additions, on the composition of the alloy produced was investigated. The method of producing lead-calcium alloys as worked out in the laboratory was also employed in industry. In the course of one hour 200 kg of the alloy of a composition of 2,'4% Ca and 0,'2% Na were produced at 850°C. Professor,Doctor A.G.Spasskiy supervised the work. There are 4 figures, 1 table, and 6 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy institut tsvetnykh metallov i zolota (Moscow Institute of Non-Ferrous Metals and Gold)

SUBMITTED: December 9, 1959

Card 2/2

SOV/149-58-6-8/19

AUTHOR: Nashel'skiy, A.Ya.

TITLE: On the Mechanism of the Reaction Between Lead and Calcium Carbide (O prirode vzaimodeystviya karbida kal'tsiya so svintsom)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, 1958, Nr 6, pp 72 - 77 (USSR)

ABSTRACT: The method of preparation of calcium-lead alloys based on the reaction $3\,Pb + CaC_2 \rightarrow Pb_3Ca + 2C$ (Reaction 1) was first developed by Kroll (Refs 1-3). Many patented processes for the preparation of alloys of lead with alkali and alkaline earth metals have been based on this method and most of the published data on the thermit processes of this type are to be found in patent specification in which the theoretical basis of the process is not discussed. The object of the present investigation was to fill in this gap by establishing experimentally the mechanism of the reaction between Pb and CaC_2. In the preliminary experiments the possibility of reaction (1) taking place was verified. To this end, a small quantity of CaC_2 was placed in a quartz ampoule which was then

Card1/9

On the Mechanism of the Reaction Between Lead and Calcium Carbide

partially filled with molten lead (since lead wets easily CaC_2, the latter compound does not float on the surface of the molten metal but is uniformly dispersed throughout its volume). On heating, the pressure in the ampoule decreased to 0.1 mm Hg. The ampoule was then sealed, placed in a vertical resistance furnace and maintained at 800 - 900 °C for 1 hour. During this period the pressure in the ampoule was reduced still further owing to the presence of CaC_2 which acted as oxygen getter. Only 0.5% Ca was found in lead after this treatment the proportion of Ca that had reacted with lead being only 5-6% of its total quantity present in CaC_2 used in the experiments. The fact that the reaction had proceeded to such a small extent was attributed to the absence of stirring, as a result of which the rate of reaction was governed solely by the rate of the diffusion processes. In addition, the reaction was slowed down by graphite and certain other impurities (mainly CaO present in CaC_2 in quantities up to 30%) being precipitated at the interface

On the Mechanism of the Reaction Between Lead and Calcium Carbide

of the reacting phases. Consequently, in the next series of experiments Pb and CaC_2 were made to react in an open crucible, under a layer of flux consisting of $CaCl_2$ with a small addition of CaF_2 (whose function was to protect the melt from oxidation and to form a slag with CaO and graphite), the contents of the crucible being stirred at the rate of 250-300 r.p.m. The experimental apparatus is shown schematically in Figure 1 where: 1) Kryptol resistance furnace; 2) steel crucible; 3) stirrer; 4) thermocouple; 5) water cooling. The experimental results are plotted in Figure 2 in the form of graphs showing the amount of Ca (in % of its original content in CaC_2) as a function of time (in minutes) at three temperatures. The effect of the particle size of CaC_2 and of the flux/CaC_2 ratio on the course of the reaction was also investigated and it was found that, in agreement with the industrial experience (Ref 6), the optimum values of these parameters were 4-6 mm for the carbide particle size

and 2.3-2.5 for the flux/carbide ratio. To determine the order of reaction 1), two experiments were carried out in which, all the other factors being equal, two different quantities C_1 and C_2 of CaC_2 were used. The values of C_1 and C_2 (in g) at the beginning of the experiments and after 30 minutes at the test temperature, their average values over this period and the mean values of the rates of reaction $\Delta C/\Delta t$ are given in Table 1. With the aid of the formula on p 74, it was found from these data that reaction 1) is of the first order. The constants of the rates of the process were calculated from:

$$K = \frac{1}{t} \ln \frac{C_o}{C_o - x}$$

where C_o - the initial concentration of Ca in the carbide, x - the decrease of the concentration of calcium, numerically equal to its quantity present in the alloy. The values of K, obtained for 820 and 920 °C, were

Card4/9 1.53×10^{-2} and 2.36×10^{-2} sec^{-1}, respectively. The

On the Mechanism of the Reaction Between Lead and Calcium Carbide

temperature dependence of K was described by the equation: $2.303 \lg K_T = -(16800/T) + 10.37$. The low value (0.054) of the temperature coefficient γ calculated from the formula:

$$\gamma = \frac{K_{920} - K_{820}}{10K_{820}}$$

indicated that the rate of reaction 1) is determined mainly by the diffusion processes. For the determination of the activation energy of the process the following equation was used:

$$\ln \frac{K_{T_1}}{K_{T_2}} = A\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

where K_{T_1} and K_{T_2} - constants of the rate of the process at temperatures T_1 and T_2, A - a constant describing

the linear relationship between K and the temperature The value of A obtained from this equation made it possible to calculate the activation energy E , since E = - AR . The comparatively low value of E = 33 000 cal also indicated the diffusion character of the investigated process. On the basis of these considerations and taking into account the fact that dissociation of CaC_2 also constitutes a reaction of the first order, the present author postulated that reaction 1) can be represented by a series of the following, successively occurring reactions:

$$CaC_2 \rightarrow Ca + 2C$$
$$Pb + Ca \rightarrow PbCa$$
$$Pb + PbCa \rightarrow Pb_2Ca$$
$$Pb + Pb_2Ca \rightarrow Pb_3Ca \quad .$$

Although CaC_2 on its own does not dissociate when heated to moderately high temperatures (700 - 1 000 °C), its dissociation during the process of the manufacture of Ca-Pb

On the Mechanism of the Reaction Between Lead and Calcium Carbide

alloy is quite possible owing to the fact that free calcium combines with lead and affects the equilibrium conditions of the system and that the halide salts used in the flux act as catalysts (Ref 7). The set of reactions proposed by the author for CaC_2 is similar to those postulated by other workers for other carbido-thermit processes. Thus, for instance, Pak Myŏng-ch'o and Bel'yayev (Ref 8) proposed the following set of reactions for the reduction of MgO by CaC_2 :

$$CaC_2 = Ca + 2C$$
$$MgO + Ca = Mg + CaO$$
$$MgO + CaC_2 = Mg + CaO + 2C .$$

Similarly, Gel'd et al. (Ref 9) considered the vacuum reduction of NaCl by CaC_2 as a series of two consecutive reactions: dissociation of CaC_2 and reduction of NaCl by Ca. On the other hand, Zviadadze and Pazukhin (Ref 10) postulated that interactions between CaC_2 and NaCl:

On the Mechanism of the Reaction Between Lead and Calcium Carbide

$$2\ NaCl + CaC_2 = 2Na + CaCl_2 + 2C$$

occurs by means of a direct exchange of electrons as a result of interdiffusion of the reacting components according to the equation $C_2^{2-} + 2Na^{+} = 2C + 2Na_{vapour}$ (Reaction 2), the electric neutrality of the reaction being secured by the migration of the Ca ions into the molten chloride. While admitting that in the case under consideration the direct interaction between Pb and CaC_2 is also possible, the present author considers that it can play only an insignificant part. He states also that an additional proof of his theory is provided by the fact that when the carbido-thermit reaction takes place in NaCl, the obtained alloy contains a definite, quite appreciable quantity of Ca, as is shown in Table 2, where the weight of the flux (in g), its composition, weight of the alloy (in g) and its composition, determined in three experiments, are given. If it is assumed that under these conditions

On the Mechanism of the Reaction Between Lead and Calcium Carbide

reaction(2) does in fact occur, the enrichment of the alloy with Ca would be possible only as a result of the secondary reaction $2Na + CaC_2 \rightleftarrows Ca + 2NaC$ (Reaction 3).

The results obtained by various investigators (Refs 11,12) who had studied these processes indicate that the possibility of reaction (3) taking place is exceedingly small, while on the other hand the presence of Ca in the alloy can be easily explained if the possibility of dissociation of CaC_2 is accepted. There are 2 figures, 2 tables and 12 references, 6 of which are Soviet and 6 English.

ASSOCIATION: Moskovskiy institut tsvetnykh metallov i zolota. Kafedra liteynogo proizvodstva (Moscow Institute of Non-ferrous Metals and Gold. Chair of Foundry Practice)

SUBMITTED: March 7, 1958

AUTHOR: Nashel'skiy, A.Ya. SOV/136-58-10-19/27

TITLE: Conditions and Consumption Coefficients of the Carbide-thermic Process (O rezhimakh i raskhodnykh koeffitsiyentakh karbidotermicheskogo protsessa)

PERIODICAL: Tsvetnyye Metally, 1958, Nr 10, pp 81 - 82 (USSR)

ABSTRACT: In this letter to the editor, the author comments on the article by V.V. Rodyakin published in Tsvetnyye Metally, 1958, Nr 4, on the carbide process for producing lead alloys. He notes that similar work was started at the end of 1956 at the Moskovskiy institut tsvetnykh metallov i zolota (Moscow Institute for Non-ferrous Metals and Gold) in the "Liteynoye proizvodstvo" (Foundry Production) laboratory under the direction of Professor Dr A.G. Spasskiy. He contrasts this work and its results with those of Rodyakin and suggests that available evidence (Refs 4,5,6,7) indicates, contrary to Rodyakin's views, that aluminium plays a minor role. As reported (Ref 8), the laboratory work at the Moscow Institute has been confirmed at the Podol'sk Aluminium Works. He concludes by stating that further

Card 1/2

Conditions and Consumption Coefficients of the Carbide-thermic Process

research is necessary on the productivity and consumption coefficients of the process.
There are 1 table and 8 references, 4 of which are Soviet, 3 English and 1 Danish.

5(2),18(7)

AUTHORS: Vigdorovich, V. N., Mashel'skiy, A. Ya. SOV/78-4-9-17/44

TITLE: The Investigation of the Interaction Between Lead and Calcium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2034-2038 (USSR)

ABSTRACT: No publications have appeared on the system of Pb-Ca alloys since 1933. Only the alloys in the interval pure lead - Pb_3Ca compound are of industrial interest (anti-friction, cabel, accumulator alloys etc.). The authors investigated the character of the non-variant transition and solubility of Ca in solid lead at various temperatures in a series of alloys containing 0.10 to 0.01 wt% Ca. The Ca content was determined according to a method by Ts. A. Meshnikova (Ref 7). As the Ca addition produces only a slight change in melting point, the method of zone melting, originally proposed for the system Al - Mn by D. A. Petrov and A. A. Bukhanova (Refs 8, 9, Fig 2) was applied: a melting zone, produced by a high frequency inductor, was led over a 70 mm long sample of the alloy at a rate of 0.175 mm/min. This zone melting process was carried out in a vacuum. Microsection surfaces were

Card 1/3

then prepared and examined microscopically. The micro-hardness was also determined (Fig 4), and proved to be constant with the exception of the initial (lower hardness) and the terminal sector (greater hardness). The calcium content of the initial sector had been lowered by the zone melting process, and that of the terminal sector raised (Fig 3). Thermal analysis according to Kurnakov (Fig 5) gave a eutectic point at 326.1° at a calcium content of approximately 0.08 wt %. The solubility of Ca was determined for the temperatures 50, 150, 200, 250 and 300° by examining the micro structure and the micro hardness (Fig 6). The maximum saturation was found at 0.07 wt % Ca.

A new variant of the phase diagram Pb - Ca is therefore proposed (Fig 7), which deviates from the data given by E. E. Schumacher and G. M. Bouton (Ref 5). There are 7 figures and 15 references, 9 of which are Soviet.

ASSOCIATION: Krasnoyarskiy institut tsvetnykh metallov im. M. I. Kalinina (Krasnoyarsk Institute for Nonferrous Metals imeni M. I. Kalinin)

SUBMITTED: May 19, 1958

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S/119/60/000/008/008/008
B019/B056

9.4174

AUTHORS: Krol', L. Ya., Candidate of Technical Sciences, Nadzhip, F. E., Engineer, Nashel'skiy, A. Ya., Candidate of Technical Sciences, Starkov, A. I., Engineer

TITLE: Thermocouples Made From Intermetallic ZnSb and CdSb Compounds

PERIODICAL: Priborostroyeniye, 1960, No. 8, pp. 28-29

TEXT: The work discussed was performed at the Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti "Gidredmet" (State Scientific Research and Planning Institute of the Rare-earth Metal Industry "Gidredmet"). By way of introduction, the authors mention several fields of application of semiconductor thermocouples, and discuss a formula for the electric energy generated by thermocouples. The good physical properties of zinc- and cadmium-antimonide for the use as thermocouples may be seen from Table 1. The characteristics of thermocouples made from compounds of this kind are given in Table 2, which were suggested by the institut poluprovodnikov

Card 1/2

83207

Thermocouples Made From Intermetallic ZnSb and CdSb Compounds

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AN SSSR (IPAN)(Institute of Semiconductors of the AS USSR). The method of preparing these compounds suggested by IPAN is discussed, after which an improved method is described. ZnSb and CdSb compounds may thus be produced in fire-clay or graphite crucibles under a protective layer. Crystallization takes place under slow cooling in the furnace, and a considerable influence is found to be exerted by the conditions of crystallization upon the physical properties. In the case of quick cooling, a metastable phase occurs, which forms only in small quantities in the case of very slow cooling. High conductivity and thermo-emf can be attained only if the content of the metastable phase is very low. An important part is also played by the degree of purity of the initial materials. The branches of the thermocouples are produced by a method developed in IPAN, which is not described in this paper. The physical properties of the thermocouples were checked by means of a circuit, the scheme of which is shown in Fig. 2. Table 4 gives data of thermocouples produced by the method described There are 2 figures and 4 tables.

Card 2/2

24.7700 1143, 1150, 1151
18.9200 1418, 1145, 1454

S/070/61/006/001/004/011
E032/E514

AUTHORS: Bogorodskiy, O. V., Nashel'skiy, A.Ya. and Ostrovskaya, V.Z.

TITLE: X-ray Study of the Solid Solutions InAs-InP

PERIODICAL: Kristallografiya, 1961, Vol.6, No.1, pp.119-121

TEXT: The basic materials employed were 99.999% pure indium (brand Ин-0 (In-0)), 99.99% pure crystalline arsenic and 99.99% pure red phosphorus "used for semiconductors of class A2". The alloys were prepared with the aid of a special furnace shown in Fig.2. The furnace consisted of two parts. The left-hand part was maintained at a high temperature and contained indium in a quartz boat, while the right-hand part was kept at a lower temperature and contained phosphorus and arsenic. This procedure has been described by the second of the present authors in Ref.5. The alloys thus obtained were subjected to zone recrystallization as described by O. G. Folberth and H. Weiss (Ref.6). Chemical analysis of the specimens was not carried out. The composition was checked by comparing the weights of the elements loaded into the ampoule and the solid solution obtained in the end. The specimens were ground in an agate mortar until the average particle size was about 0.01 mm.

IX

S/070/61/006/001/004/011
E032/E514

X-ray Study of the Solid .....

The X-ray photographs were obtained by the Debye method, using copper radiation in the PKY (RKU) camera (86 mm in diameter). The X-ray photographs were measured up on the IZA-2 (IZA-2) comparator. The lattice parameters were calculated from the 642 and 731 reflections. The table shows the lattice parameters obtained.

Table

Lattice parameters of solid solutions of the InAs-InP system

Composition, mol.% InAs	InP	Lattice period, Å Folberth (Ref.1)	Koster and Ulrich (Ref.4)	Present data
100	0	6.04	6.06	6.042±0.001
95	5	-	-	6.034
90	10	-	-	6.026
80	20	-	-	6.016
75	25	5.99	6.02	-
60	40	-	-	5.960
50	50	5.93	5.96	5.935
40	60	-	-	5.910
30	70	-	-	5.892

Card 2/4

(Table cont.)

Table cont.

Composition, mol.% InAs	InP	Lattice period, Å Folberth (Ref.1)	Koster and Ulrich (Ref.4)	Present data
25	75	5.89	5.92	-
20	80	-	-	5.876
10	90	-	-	5.857
0	100	5.86	5.88	5.860

Fig.4 shows the dependence of the width of the diffraction lines and the physical broadening (micro-liquidation effect) on the composition after zone equalization. The physical broadening was calculated from the formula

$$\beta = \sqrt{B^2 - b^2}$$

where B is the width of the broadened line and b is the width of a standard line for InAs. There are 4 figures, 1 table and 8 references: 3 Soviet and 5 non-Soviet.

Card 3/4

20026

S/070/61/006/001/004/011
E032/E514

X-ray Study of the Solid .....

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Scientific Research and Project Institute of the Rare Metal Industry)

SUBMITTED: July 15, 1960

Fig.2

Рис. 2

Fig.4

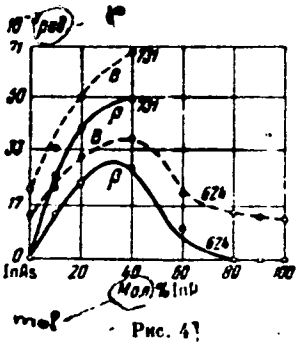


Рис. 4

Card 4/4

88718

S/032/61/027/002/009/026
B134/B206

9.4300 (1043, 1150)

AUTHORS: Krol', L. Ya., Nashel'skiy, A. Ya., and Khlystovskaya, M. D.

TITLE: Method for the graphite coating of quartz workpieces

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 2, 1961, 177-178

TEXT: To prevent a reaction between quartz and semiconductor materials, the surface of the former is coated with a thin carbon layer. No exact data on applying such coats are to be found in relevant publications. In this paper, a method is described for applying carbon coatings on quartz surfaces, which is based on a pyrolysis of pure organic compounds (such as acetone). The thermal decomposition of acetone proceeds most favorably at 700°C, CO_2, CH_4, hydrogen, and ethylene being formed. The latter dissociates and contains the complex anion $(C=C)^{2-}$, which easily polymerizes to the graphite lattice. Since the separated carbon is in an active state, it adsorbs well on the quartz surface. Heating the graphitized quartz piece in vacuum apparently strengthens the quartz-carbon bond through formation of silicon carbide, which was also determined microscopically.

Card 1/2

S/032/61/027/002/009/026
B134/B206

Method for the graphite coating...

Graphitizing takes place in a special apparatus which consists, in principle, of a heatable quartz tube through which argon is conducted serving as a carrier gas for the acetone vapor. Best results were obtained at 700°C and a duration of 30 min. The graphitized object is ignited in vacuum (0.05 mm Hg) at 1100-1200°C for 2-3 hr. There are 2 figures, 1 table, and 3 non-Soviet-bloc references.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Scientific Research and Planning Institute of the Rare Metal Industry)

Card 2/2

37637
S/076/62/036/005/012/013
B101/B110

26 1420

AUTHORS: Marina, L. I., Nashel'skiy, A. Ya., and Yakobson, S. V.

TITLE: Investigation of the vapor pressure of gallium-phosphide dissociation

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 5, 1962, 1086-1088

TEXT: The heat of formation and the vapor pressure on dissociation were determined for gallium phosphide, synthesized by zone melting of an unsaturated solution of gallium phosphide in gallium with phosphorus. The gallium excess remaining after the melting process was removed by dissolution in HCl in the presence of a platinum catalyst. X-ray analysis revealed only one phase, the data of which were consistent with publications. The vapor pressure was determined by the "dew-point method" as proposed by K. Weisser, (J. Phys. Chem., 61, 513, 1957). Although the change in color of the dissociated phosphorus from yellow to red interfered with the measurement it was possible, by quick cooling of the ampoule, to fix the point when condensation of the yellow phosphorus began. Results: (1) The vapor pressure of gallium-phosphide dissociation obeys the equation

Card 1/2

Investigation of the vapor ...

log P = -10,760/T + 9.996. (2) At the melting point of gallium phosphide (1525°C), the vapor pressure is 13.45 atm. (3) The heat of formation of gallium phosphide is 49,511 ± 2970 cal/mole. There are 3 figures and 1 table. The most important English-language references are: D. Mandelkorn, Proc. 9, K. E., 47, 2012, 1959; G. Wolff, P. H. Keck and J. D. Broder, Phys. Rev., 94, 753, 1954; C. J. Frosch and L. Derick, J. Electrochem. Soc., 108, 1961.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkoy metallicheskoy promyshlennosti (State Design and Planning Scientific Research Institute of the Rare Metals Industry)

SUBMITTED: August 6, 1961

Card 2/2

S/020/62/144/001/023/024
B124/B101

AUTHORS: Vigdorovich, V. N., and Nashel'skiy, A. Ya.

TITLE: Synthesis of compounds containing a volatile component

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 1, 1962, 182-185

TEXT: An attempt is described to use directional crystallization in the synthesis of indium phosphide from its elements, as an example for the synthesis of compounds exhibiting high dissociation pressure at their melting points. According to theoretical analyses (J. van der Boomgard, see below), the quaternary point in the equilibrium diagram of the system consisting of the non-volatile component A (solid), the volatile component B (vapor), the solution of B in A (liquid), and the compound AB (solid) in pressure-temperature-composition coordinates is found to correspond to low pressures (1 to 4 at) and to a low percentage of component B (in the melt) at temperatures near the melting point of component A. Thus, not only can the compound be synthesized, but also crystallization can take place from highly dilute melts at temperatures below the melting point of the compound when both pressure and temperature are only slightly

Card 1/3

increased. Single crystals are obtained by incongruent crystal growth. Two basic techniques of directional crystallization are feasible: either by building up a temperature gradient (normal directional crystallization or extraction from melt), or by building up and shifting the high-temperature zone (synthesis by zone crystallization). In the former case, the crystallization front advanced 3 mm/hr toward higher temperatures, whereas in the latter case, rates up to 25 mm/hr were obtained. Course-grained semiconducting bars with a resistivity ρ = 0.05 ohm·cm and a Hall constant R_x = 300 cm^3/coul were prepared. Microhardness values of 463 (with 20 g load), 372 (with 40 g load), 348 (with 70 g load), and 315 kg/mm^2 (with 100 g load) were obtained with mean arithmetic deviations of 26, 10, 9.5, and 8.5 kg/mm^2, respectively. The method described may also be used for purifying InP by zone recrystallization. The most important English-language reference is: J. van der Boomgard, K. Schol, Philips Res. Rep.,12,127 (1957).

S/020/62/144/001/023/024
Synthesis of compounds containing a ... B124/B101

ASSOCIATION: Institut tsvetnykh metallov im. M. I. Kalinina (Institute of Nonferrous Metals imeni M. I. Kalinin). Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Design and Planning Institute of the Rare Metals Industry)

PRESENTED: January 26, 1962, by S. I. Vol'fkovich, Academician

SUBMITTED: February 7, 1962

Card 3/3

S/126/63/000/002/006/014
E076/E101

AUTHOR: [illegible]

TITLE: On a method of measuring microhardness and its dependence upon the composition of brittle materials

PERIODICAL: Fizika metallov i metallovedeniye, no. 2, 1963, 43 - 48

TEXT: The investigation was carried out to make more precise the methods of determining micro-brittleness and to establish a correlation between the brittle properties of the material and results of measuring microhardness. From the data obtained optimum measuring conditions must be selected and the results correctly explained. A five-point scale for evaluating micro-brittleness of refractory compounds, employed by Semenov, Meshpor and Khrenova, was specified for investigating solid solutions of the InAs-InP system (Figure 1). The scale is tabulated. The summary brittle point is determined by formula $Z_p = \sum_{i=0}^{i=5} i \cdot n_i$ where n_i is the relative number of imprints having a corresponding brittle point ($i = 0.1..5$). The summary brittle point is equal to zero ($Z_p = 0$) if one of

Card 1/3

On a method of measuring...

the impurity atoms be crushed. The microhardness is a direct linear function of the brittle point. This function is used to obtain the true microhardness value, corresponding to zero brittleness, by graphical extrapolation. The dependence of the brittle properties in the InAs-InP system upon its composition was studied. Micro-brittleness of the InAs system remains almost unchanged at varying load, whereas that of InP varies considerably. The "micro-brittleness - composition" curve shows a maximum whose location is shifted from InP to InAs as the load increases. Microhardness in the InAs-InP system was measured by the method recommended. The data obtained show a maximum on the "concentration-microhardness" dependence curve. Maximum microhardness value in the InAs-InP system at 50 g load, exceeds by 25 kg/mm^2 the microhardness of a harder InP compound, and is shifted to the side of alloys with a high content of the InP compound. Khrakov's general laws on the changes in the physico-mechanical properties depending on the chemical composition are confirmed. There are 4 figures and 1 table.

ASSOCIATION: Nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (Scientific-Research and Planning Institute of the Rare-Metal Industry)

SUBMITTED: January 19, 1962

Card 3/3

S/226/63/000/002/006/014
A006/A101

On a method of measuring...

Figure 1. Specified grain for determining the brittle point of mold solutions in the Inde-Ind system and other brittle materials (designations given in the table below)

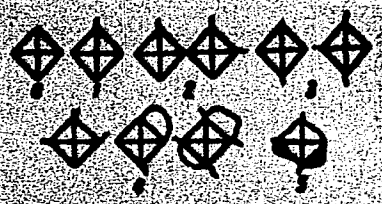


Table. Reference scale for evaluating the micro-brittle point of refractory materials

Brittle index	Nature of imprint
0	Without visible cracks and splits
1	One small crack
2	One crack, that does not coincide with the prolonged diagonal of the imprint. Two cracks in the contiguous corners of the imprint
3	Two cracks in the opposite corners of the imprint
4	Other more cracks; one or two splits at the imprint sides
5	Breakdown of the imprint shape

Card 3/3

NASHEL'SKIY, A., kand. tekhn. nauk

Electron in zonal refining. Nauka i zhizn' 30 no.6:29 Je '63. (MIRA 16:7)

(Electrometallurgy)

ACCESSION NR: AP4039410 S/0070/64/009/003/0436/0439

AUTHORS: Lishina, A. V.; Medvedev, S. A.; Mashel'skiy, A. Ya.; Sakharov, B. A.

TITLE: Morphology of gallium phosphide crystals grown from the gas phase

SOURCE: Kristallografiya, v. 9, no. 3, 1964, 436-439

TOPIC TAGS: crystal growth, twinned crystal, gallium phosphide

ABSTRACT: The crystals were obtained in a stream of inert gas by a method modified from that proposed by M. Gerchenszon and R. M. Mikulyak (J. Electrochem. Soc., 108, 6, 548-51, 1961). The procedure yielded transparent yellow-orange crystals of two principal forms: acicular and ribbon shaped. The acicular crystals formed three-sided prisms with equilateral triangular cross sections. Occasional hexagonal cross sections were observed. The direction of growth was the [111] axis. The tops of the crystals were generally bounded by octahedral faces {111}; the sides were bounded by the {110} form. Crystals with triangular cross section showed what appeared to be twinning on the (110) plane, but crystals with hexagonal cross sections did not show this. The tabular ribbon crystals grew in the [112] direction. The basal plane was (111). The {111} and {100} forms were dominant. Twins occurred on at least two composition planes, one type of twin being very

Card 1/2

ACCESSION NR: AP4039410

distinct in thin sections cut perpendicular to [117]. Orig. art. has: 5 figures.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Scientific Research and Planning Institute for the Rare Metal Industry)

SUBMITTED: 18Aug63 ENCL: 00

SUB CODE: SS NO REF SOV: 001 OTHER: 008

Card 2/2

L 12464-65 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Pu-4 AS(mp)-2/
RAEM(a)/RAEM(c)/ESD(gs)/ESD(t) JD/JG

ACCESSION NR: AP4048431 S/0181/64/006/011/3467/3468

AUTHOR: Sheetakova, N. A.; Gurevich, M. A.; Marina, L. I.; Nashel'skiy, A. Ya.

TITLE: Micrographic investigation of gallium-phosphide crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 11, 1964, 3467-3468

TOPIC TAGS: compound semiconductor, gallium phosphide crystal, single crystal growth, crystal etching, crystal structure defect, crystal dislocation, twin crystal

ABSTRACT: The microstructure of gallium-phosphide crystals has been studied using a new etching formulation to reveal structural differences between the crystals grown by different methods (from stoichiometric or nonstoichiometric melts and from vapor phase). The practical importance of gallium phosphide was emphasized as one of the most promising $A^{III}B^{V}$-compound semiconductors. The etching formulation contained trivalent iron ion as an oxidant and hydrochloric acid as the solvent for gallium oxide. Micrographs of the etched acicular or

Card 1/2

L 12464-65
ACCESSION NR: AP4048431

lamellar crystals revealed not only dislocations, but also other structure defects such as bands or spirals of growth. Dislocation etch pits were described as triangular pyramids uniformly distributed in most lamellar crystals and clustered around the boundary between two differently oriented regions in acicular crystals. Two differently oriented regions were also observed in lamellar crystals. These observations led to the conclusion that some of the crystals grown by either method were twins or contained differently oriented inclusions. Orig. art. has: 2 figures.

ASSOCIATION: Gosudarstvenny*y nauchno-issledovatel'skiy i proektny*y institut redkometallicheskoy promy*shlennosti, Moscow (State Design and Planning Scientific Research Institute of the Rare Metals Industry)

SUBMITTED: 15May64 ENCL: 00 SUB CODE: SS

NO REF SOV: 001 OTHER: 004 ATD PRESS: 3126

Card 2/2

L 62711-65 EWA(h)/EWT(m)/EWT(l)/EWA(c)/EWP(i)/EWP(b)/T/EWP(e)/EWP(t) Pz-6/Peb

ACCESSION NR: AP5021703 IJP(c) AT/JD UR/0074/64/033/009/1085/1106

AUTHOR: Vigdorovich, V. N.; Mashel'skiy, A. Ya.

TITLE: Methods of producing semi-conductor compounds

SOURCE: Uspekhi khimii, v. 33, no. 9, 1964, 1085-1106

TOPIC TAGS: crystal, semiconductor single crystal, semiconducting material

Abstract: Synthesis, purification, alloying and growing of monocrystals are methods for obtaining semi-conductor compounds. Methods have been suggested by which semi-conductor compounds can be obtained based on certain physico-chemical characteristics of the compounds themselves: 1) compounds with low vapor pressure at the boiling point (antimonides); 2) compounds with higher vapor pressure and boiling point (arsenides and phosphides of indium and gallium); 3) compounds high boiling points and high vapor pressures when melted (arsenides and phosphides of aluminum, nitrites, and borides). Semi-conductor compounds can be obtained: directly or indirectly. Direct methods require bringing the starting components into contact, and then remaining the reaction product from the reaction zone by converting it into another state of aggregation. Indirect methods are often used in preliminary operations before obtaining compounds in the form of compact

Card 1/2

L 62711-65

ACCESSION NR: AP5021703

semi-conductor compounds include condensation, sintering, resublimation and crystallization. Methods of obtaining decomposing semi-conductor compounds include methods without pressure regulation, with vapor pressure of the volatile component regulated, use of counter pressure and crystallization from non-stoichiometric melts. Orig. art. has 8 figures and 2 formulas.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Scientific-Research and Design Institute of the Rare-Metal Industry)

SUBMITTED: 00 ENCL: 00 SUB CODE: SS

NO REF SOV: 027 OTHER: 093 JPRS

Card 2/2

ACCESSION NR: AP4033514 S/0076/64/038/003/0551/0555

AUTHOR: Marina, L. I. (Moscow) Nashel'skiy, A. Ya. (Moscow); Vigdorovich, V. N. (Moscow); Bakanova, D. D. (Moscow)

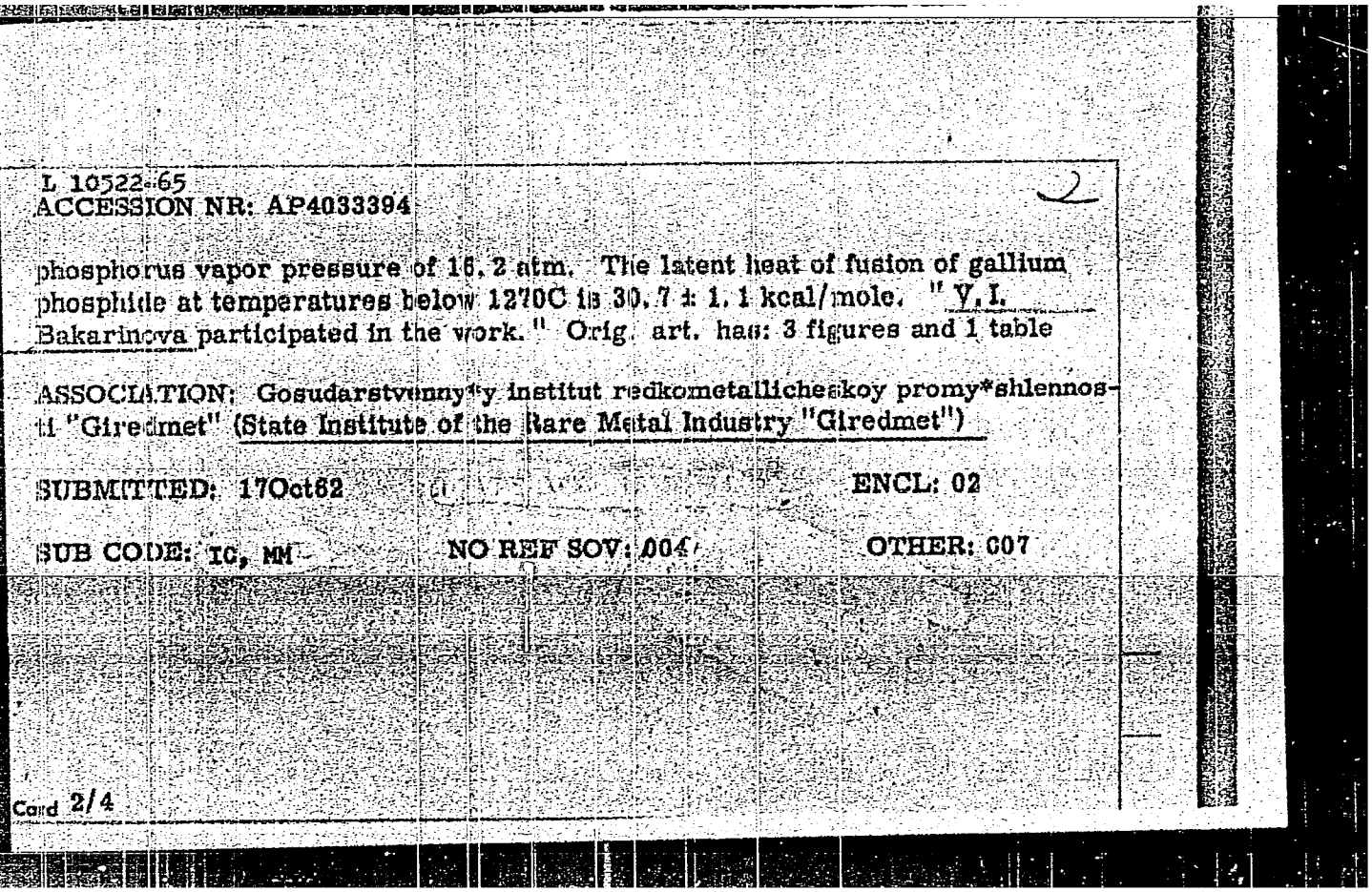
TITLE: Investigation of alloys of the gallium-gallium phosphide system

SOURCE: Zhurnal fizicheskoy khimii, v. 33, no. 3, 1964, 551-555

TOPIC TAGS: gallium, gallium phosphide system, alloy, gallium alloy, melting point, heat of fusion, gallium phosphide, phase diagram

ABSTRACT: The gallium-gallium phosphide system was studied, and the temperature and heat of fusion of gallium were determined. Since gallium phosphide decomposes on boiling to a melt rich in gallium and phosphorus vapor, the three independent variables, concentration x, temperature T, and pressure p for the gallium-gallium phosphide system were plotted (see Fig. 1 of enclosure) and a spatial phase diagram was constructed (see fig. 2 of enclosure). The melting point of gallium phosphide was found to be 1622C at an equilibrium

Card 1/4



L 10522-65
ACCESSION NR: AP4033394

2

phosphorus vapor pressure of 16.2 atm. The latent heat of fusion of gallium phosphide at temperatures below 1270C is 30.7 ± 1.1 kcal/mole. "V.I. Bakarinova participated in the work." Orig. art. has: 3 figures and 1 table

ASSOCIATION: Gosudarstvennyy institut redkometallicheskoy promy*shlennosti "Giredmet" (State Institute of the Rare Metal Industry "Giredmet")

SUBMITTED: 17Oct62 ENCL: 02

SUB CODE: IC, MM NO REF SOV: 004 OTHER: 007

Card 2/4

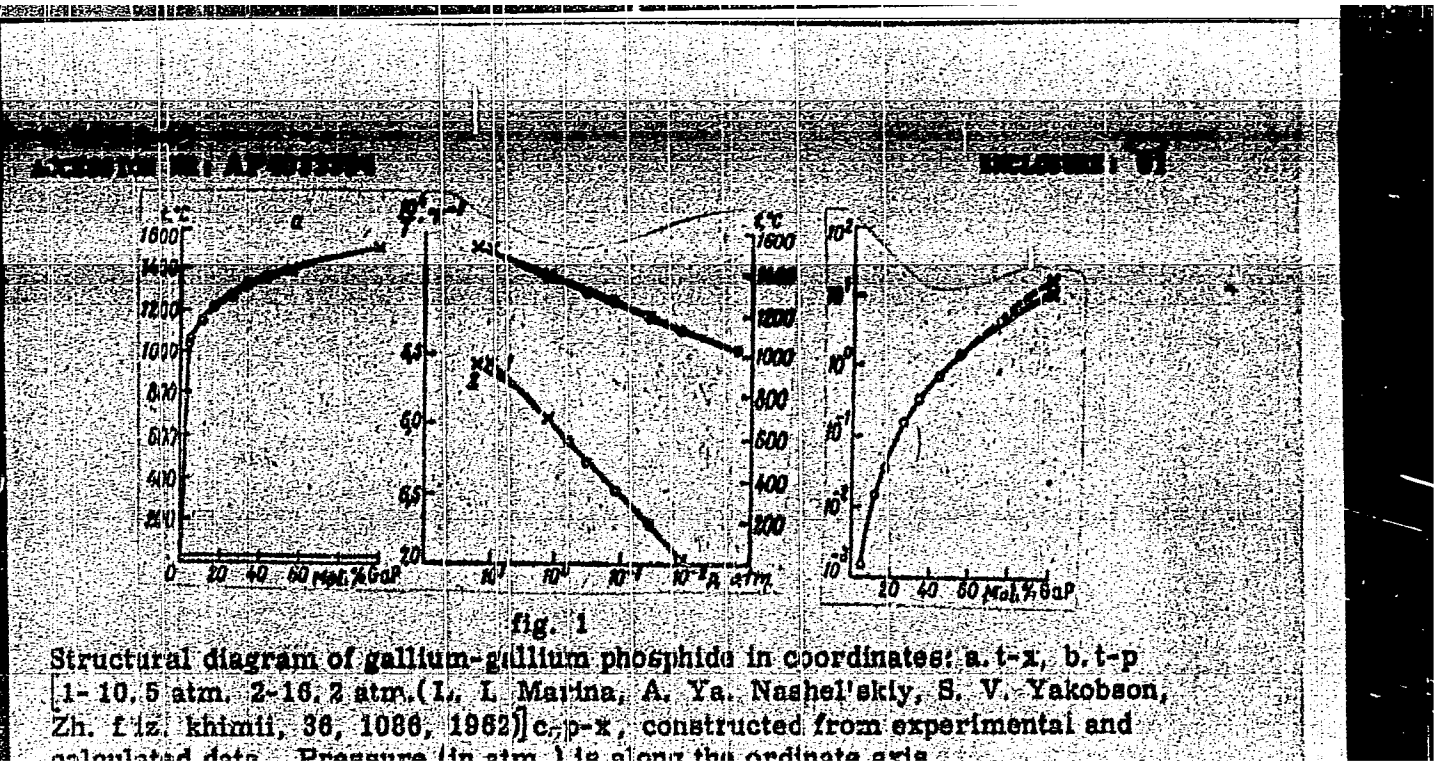


fig. 1

Structural diagram of gallium-gallium phosphide in coordinates: a. t-x, b. t-p [1- 10.5 atm, 2-16.2 atm.(I. L. Marina, A. Ya. Nashel'skiy, S. V. Yakobson, Zh. f iz. khimii, 36, 1066, 1962)] c. p-x, constructed from experimental and calculated data. Pressure (in atm.) is plotted on the ordinate axis

Zh. f iz. khimii, 36, 1086, 1962] c-p-x, constructed from experimental and calculated data. Pressure (in atm.) is along the ordinate axis

Card 3/4

L 10522-65
ACCESSION NR: AP4033394

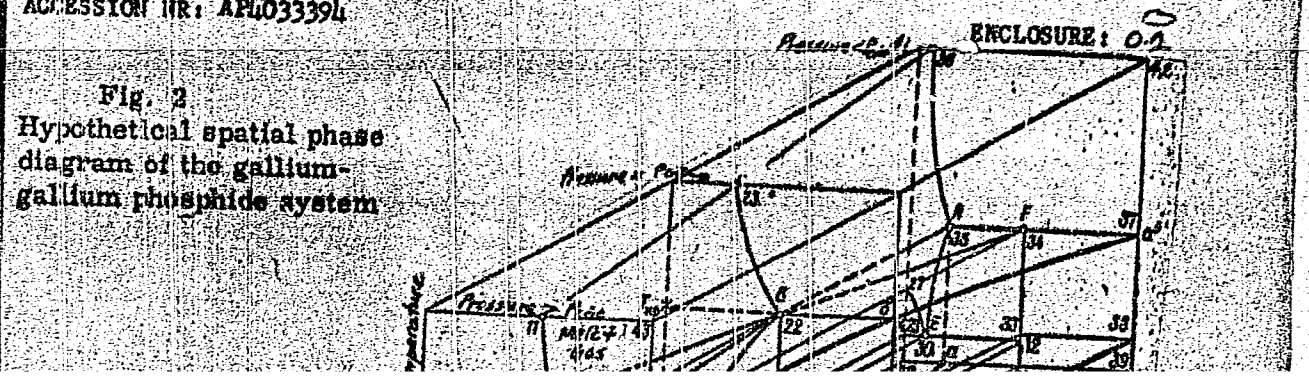
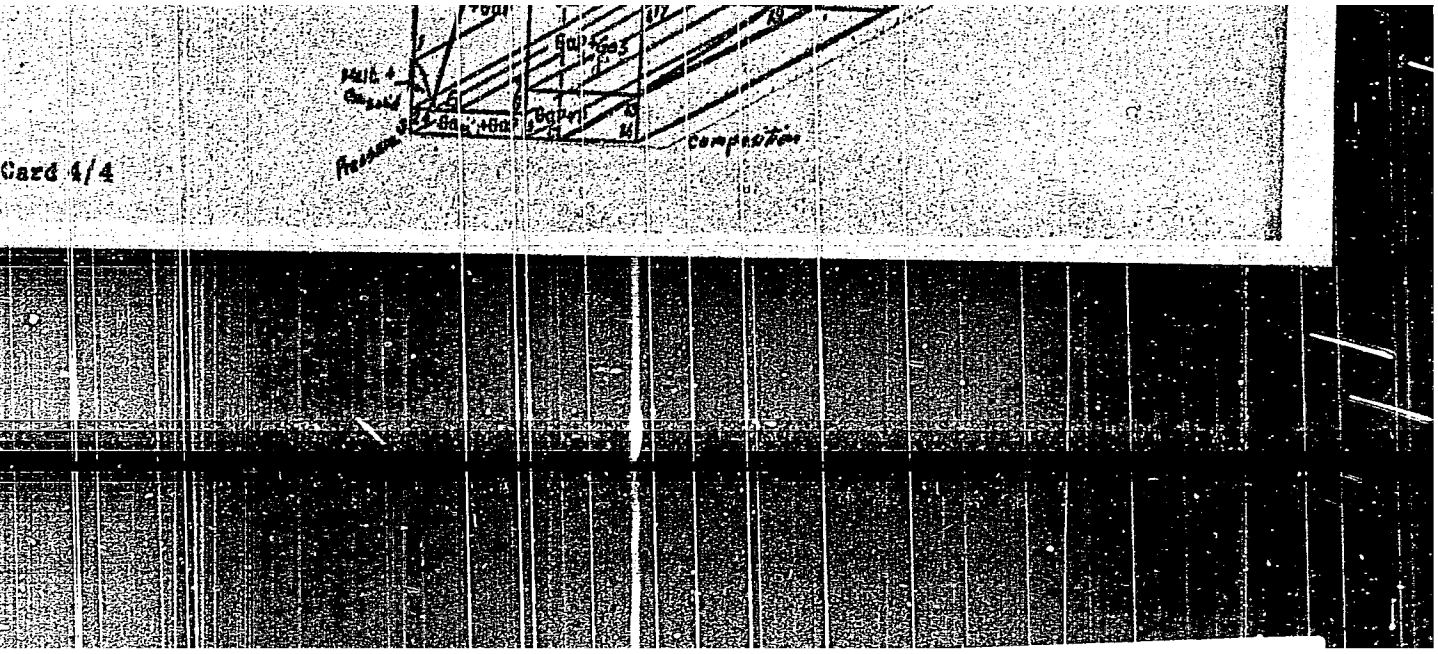


Fig. 2
Hypothetical spatial phase diagram of the gallium-gallium phosphide system



ACCESSION NR: AP4034577 S/0076/64/038/004/0891/0895

AUTHOR: Nashel'skiy, A. Ya. (Moscow); Ostrovskaya, V. Z. (Moscow); Yakobson, S. V. (Moscow)

TITLE: The equilibrium vapor pressure of phosphorus at the melting point of indium phosphide

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 4, 1964, 891-895

TOPIC TAGS: indium phosphide, phosphorus, vapor pressure, dissociation pressure, indium phosphide indium system, dew point method, static method, phosphorus molecularity

ABSTRACT: The dissociation pressure of indium phosphide was investigated by different methods described in the work by L. I. Marina, A. Ya. Nashel'skiy and S. V. Yakovson, (Zh. fiz. khimii, 36, 1086, 1962). The equilibrium vapor pressure of white phosphorus over an In-InP melt was determined by the dew point method. The dissociation pressure of InP at temperatures from 850-1070C was measured in quartz ampoules. The authors feel the most accurate data on the vapor pressure of phosphorus in contact with molten InP was obtained by the static method,

Card 1/2

ACCESSION NR: AP4034577

measuring the pressure in ampoules provided with a quartz spiral. The vapor pressure of phosphorus over indium phosphide was found to be in the 40-45 atm. range, but more definite values could not be computed because of the dissociation pressure of the phosphorus existing as a four-atom molecule. The molecularity of the phosphorus vapor depends on the dissociation temperature of the molecules of phosphorus vapor and the association of the phosphorus atoms at high pressures. The deviation in the vapor pressure values found was considered to be not too great since the dissociation of the molecules of phosphorus vapor at high pressures is less than 10%. Orig. art. has: 3 tables and 1 figure.

ASSOCIATION: Gosudarstvenny*y nauchno-issledovatel'skiy i proyektny*y institut redkometallicheskoy promy*shlennosti "Giredmet" (State Scientific Research and Planning Institute of the Rare Earth Industry "Giredmet")

SUBMITTED: 08Apr63 ENCL: 00

SUB CODE: ME, IC NO REF SOV: 002 OTHER: 006

Card 2/2

AM6030486

AUTHOR: Nashel'skiy, A. Ya.

SOURCE CODE: 0275/66/000/006/B010/B010

TITLE: Modern methods of synthesis and growing single crystals from decomposing semiconductor compounds

SOURCE: Ref. zh. Elektronika i yeye primeneniye, Abs. 6B66

REF SOURCE: Sb. Simpozium. Protsessy sinteza i rosta kirstallov i plenok poluprovodnik. materialov, 1965. Tezisy dokl. Novosibirsk, 1965, 25-29

TOPIC TAGS: semiconductor material, semiconductor single crystal, semiconductor compoud, semiconducting film

ABSTRACT: Due to their higher reactivity, melting temepratures, and vapor pressures, the processing and equipment for producing semiconductor-compound crystals is more complicated than the processing and equipment used in production of elementary semiconductors (Ge, Si). To solve the processing problem involved in the production of semiconductor compounds, the knowledge of phase diagrams, dissociation pressure, temperature relations, specific heat capacity, latent melt heat, etc. is necessary. The semiconductor-compound production includes synthesis, refining, and single-crystal growing. The state of source materials used in the synthesis has a great bearing on the synthesis and the method of separation. With a direct synthesis, the interaction

Card 1/2

UDC: 621.315.592:548

ACC NR: AR6030486

among source materials can materialize through diffusion and also through kinetic reactions. With an indirect synthesis, the interaction among source materials that have an intermediate-compound form is materialized through the reactions of substitution, replacement, redox, disproprotionation, etc. Selective etching, vacuum distilling off volatile components, crystallisation, sorption, etc. are used as separation processes. Various combinations of synthesizing and separating processes may yield new methods of semiconductor-compound production. Continuous and joint equipment permitting several operations in series should be developed. Methods of semiconductor-compound production in the form of single-crystal layers and films have great importance. V. U. [Translation of abstract]

SUB CODE: 09, 11

Card 2/2

L 65238-65 EWT(1)/EWP(n)-2/EWA(1) IM

ACCESSION NR: AP5012594 UR/018/65/017/005/1590/1592

AUTHOR: Aliyev, S. A.; Nashel'skiy, A. Ya.; Shalyt, S. S.

TITLE: Thermal conductivity and thermal emf of n-type indium phosphide at low temperatures

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1590-1592

TOPIC TAGS: thermal conductivity, thermal emf, indium compound, semiconducting material, phonon interaction, phonon scattering, electron scattering

ABSTRACT: The purpose of investigating simultaneously the thermal conductivity and thermal emf at low temperatures in the same sample was to disclose certain interesting features of electron-phonon interaction, which manifest themselves in experiment in an electron dragging effect. The authors investigated a coarse-grain polycrystal of InP (1.3 x 2.5 x 40 mm), in which the electron density and mobility at 77K were 2 x 10^{16} cm^{-3} and 8000 cm^2/V-sec. The thermal conductivity was investigated in a vacuum chamber at a pressure less than 10^{-5} mm Hg. The temperature difference was measured in the 2--300K range. The results are shown in Fig. 1 of the Enclosure. On the descending branch of the curve, the temperature dependence of the thermal conductivity agrees with the theory of J. Callaway (Phys. Rev. v. 113, 1046, 1959), and the temperature dependence of the thermal emf reflects the

113, 1046, 1959), and the temperature dependence of the thermal emf reflects the

Card 1/3

L 65230-65

ACCESSION NR: AP5012594

6

dragging of the electrons by the phonons. From the fact that the maxima of both curves coincide it is deduced that the major role in the investigated InP sample was played by pointlike defects, which scatter the short-wave phonons more strongly. It is also concluded that in the region of the maximum of the thermal emf (16K) the electrons are scattered by ionized impurities. The fraction of the phonon component of the thermal emf at this temperature is found to be 300 μV/deg. Orig. art. has: 2 figures.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors, AN SSSR); Institut fiziki AN AzSSR, Baku (Institute of Physics, AN AzSSR)

SUBMITTED: 31Dec64 ENCL: 01 SUB CODE: SS, TD

NR REF SOV: 002 OTHER: 005

L 65231-65

ACCESSION NR: AP5012594

ENCLOSURE: 01

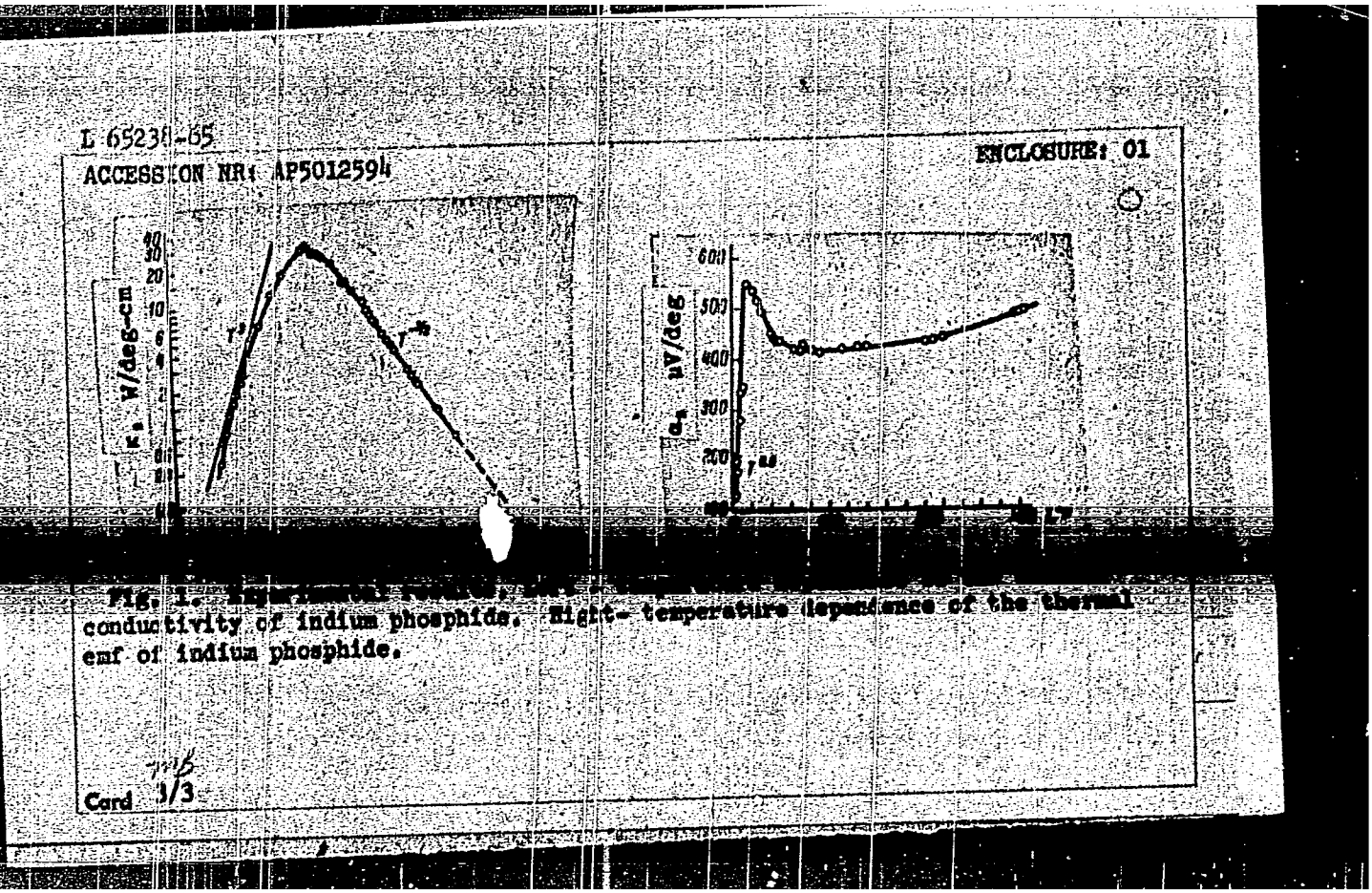


Fig. 1. Experimental results. Left- temperature dependence of the thermal conductivity of indium phosphide. Right- temperature dependence of the thermal emf of indium phosphide.

Card 1/3

L 5754[illegible] EWA(k)/EWP(r)/[illegible](l)/EWT(m)/EWG(k)-2/EWP(l)/ELC(t)/T/EWP(t)/ SCTB/
ELC(b)-2/EWP(k)/EWP(b)/[illegible](m)-2/EWP(h) Pf-4/Pl-4/P1-4/P[illegible]-4/Pn-4/Po-4/Peb
IJP(c) WG/JD/JG UR/0181/65/007/006/1902/1904

ACCESSION NR: AP5014611

AUTHOR: Basov, N. G.; Yelisayev, P. G.; Nikitin, V. V.; Linhina, A. V.; Maslov, V. N.; Neshel'skiy, A. Ya. 79 78 B

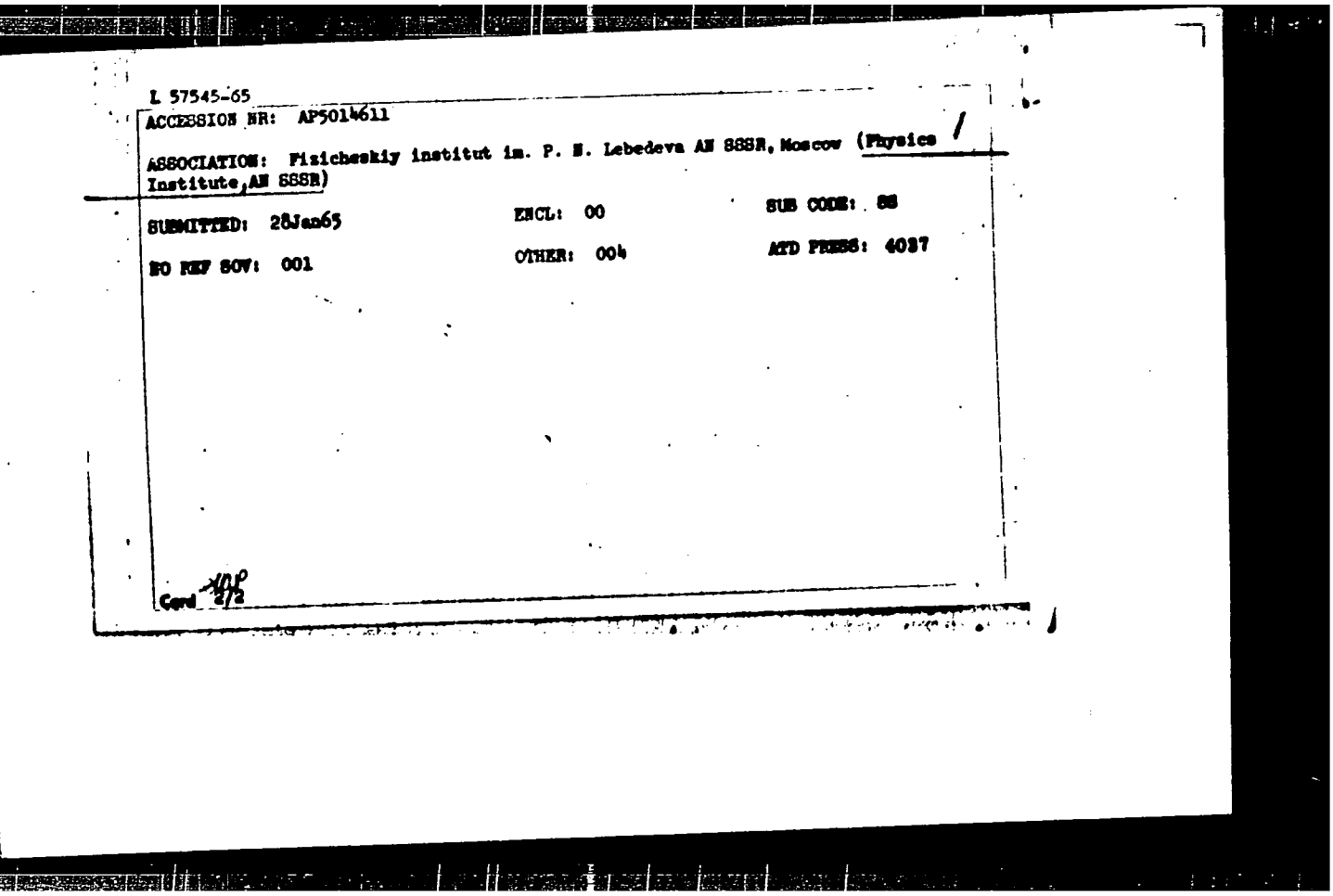
TITLE: A semiconductor $GaAs_{1-x}P_x$ junction laser

SOURCE: Fizika tverdogo tela, v. 7, no. 6, 1965, 1902-1904

TOPIC TAGS: laser, semiconductor laser, junction laser, injection laser, stimulated emission, gallium arsenide, gallium phosphide

ABSTRACT: A $GaAs_{0.85}P_{0.15}$ pulsed injection laser operating at 77K is described. The monocrystalline solid solution of $GaAs_{0.85}P_{0.15}$ was prepared by epitaxial growth (sandwich method). The p-n junction was formed at a depth of 26 μ by diffusing zinc at 850C for 2.5 hr into a polished 6.5 μ thick wafer of $GaAs_{0.85}P_{0.15}$. Coherent emission was observed at 7420 Å at a threshold current density of 7900 amp/cm^2. A high resolution spectrum of laser emission showed multimode oscillations similar to those of GaAs injection lasers. The high threshold current density was attributed to optical inhomogeneity of the epitaxial film. Dimensions of the laser, pulse duration, and repetition rate are not given. Orig. art. has: 2 figures. [03]

Card 1/ 2



L 57545-65
ACCESSION NR: AP5014611

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 28Jan65	ENCL: 00	SUB CODE: SS
NO REF SOV: 001	OTHER: 004	ATD PRESS: 4037

Card 1/2

L 10235-66 EWT(l)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) LIP(c) JD/GG

ACC NR: AP6001232 SOURCE CODE: UR/0363/65/001/012/2154/2157

AUTHOR: D'yakonov, L. I.; Lishina, A. V.; Maslov, V. N.; Mashel'skiy, A. Ya.; Sokolov, B. A. 68 B

ORG: Giredmet

TITLE: Epitaxial growing of single crystals of gallium phosphide-gallium arsenide solid solutions

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 12, 1965, 2154-2157

TOPIC TAGS: single crystal, single crystal growth, epitaxial growing, chemical transport reaction, gallium arsenide, gallium phosphide, quasibinary solid solution, semiconductor single crystal

ABSTRACT: Single crystal epitaxial layers of GaP_xAs_{1-x} solid solutions have been deposited on GaAs single crystal wafers of a given crystallographic orientation by a chemical-transport reaction in a close-spaced system (sandwich method). The purpose of the work was to grow GaP_xAs_{1-x} layers thick enough to be used separately from the substrate in various semiconductor devices of the most advanced type. References to Western sources suggested the use of GaP_xAs_{1-x} solid solutions in laser diodes, luminescent diodes with monocoherent emission characteristics, and in light modulating devices. Earlier, the sandwich method was successfully applied by Soviet scientists

Card 1/2 UDC: 546.681'181.1+546.681.191

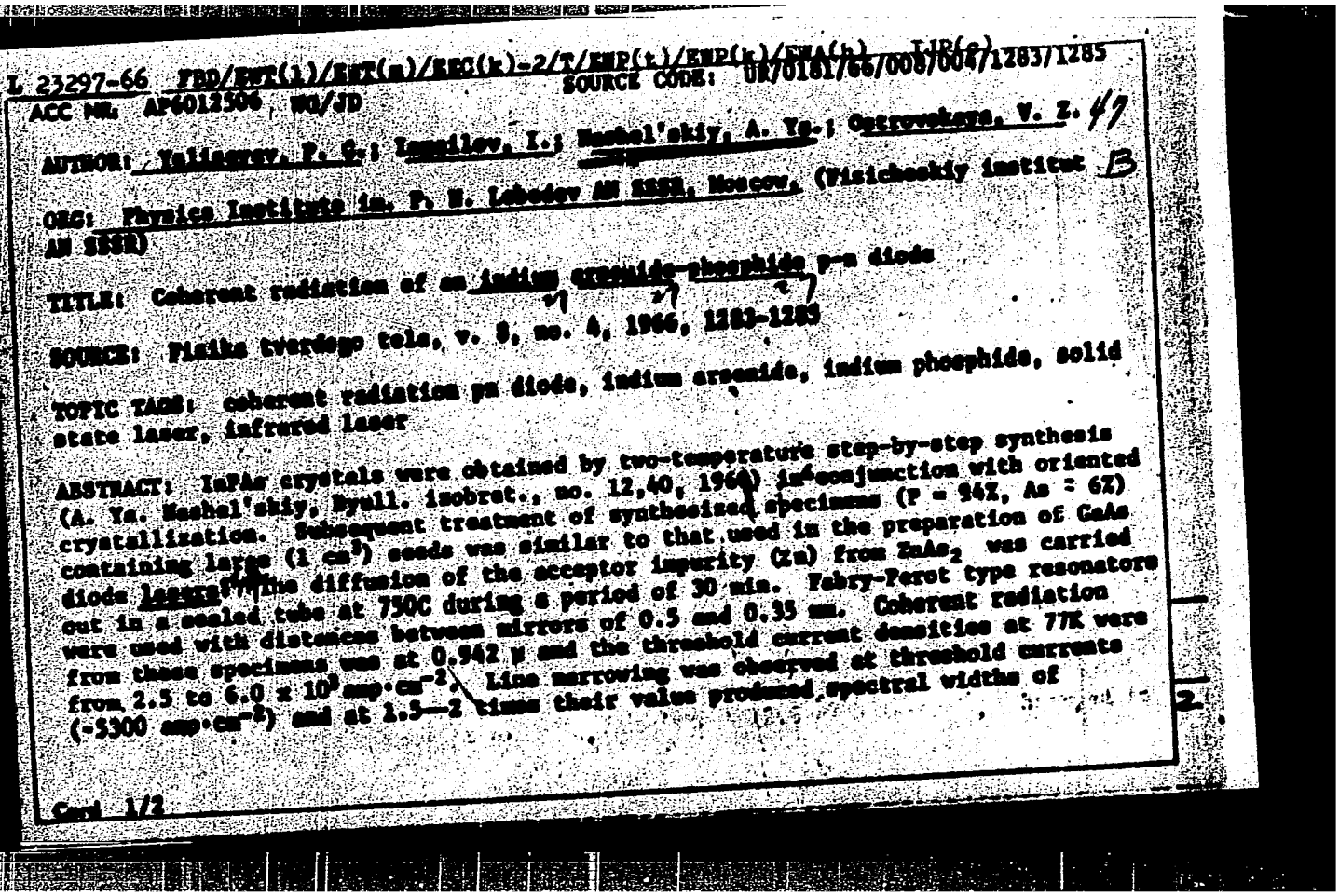
L 10235-66

ACC NR: AP6001232

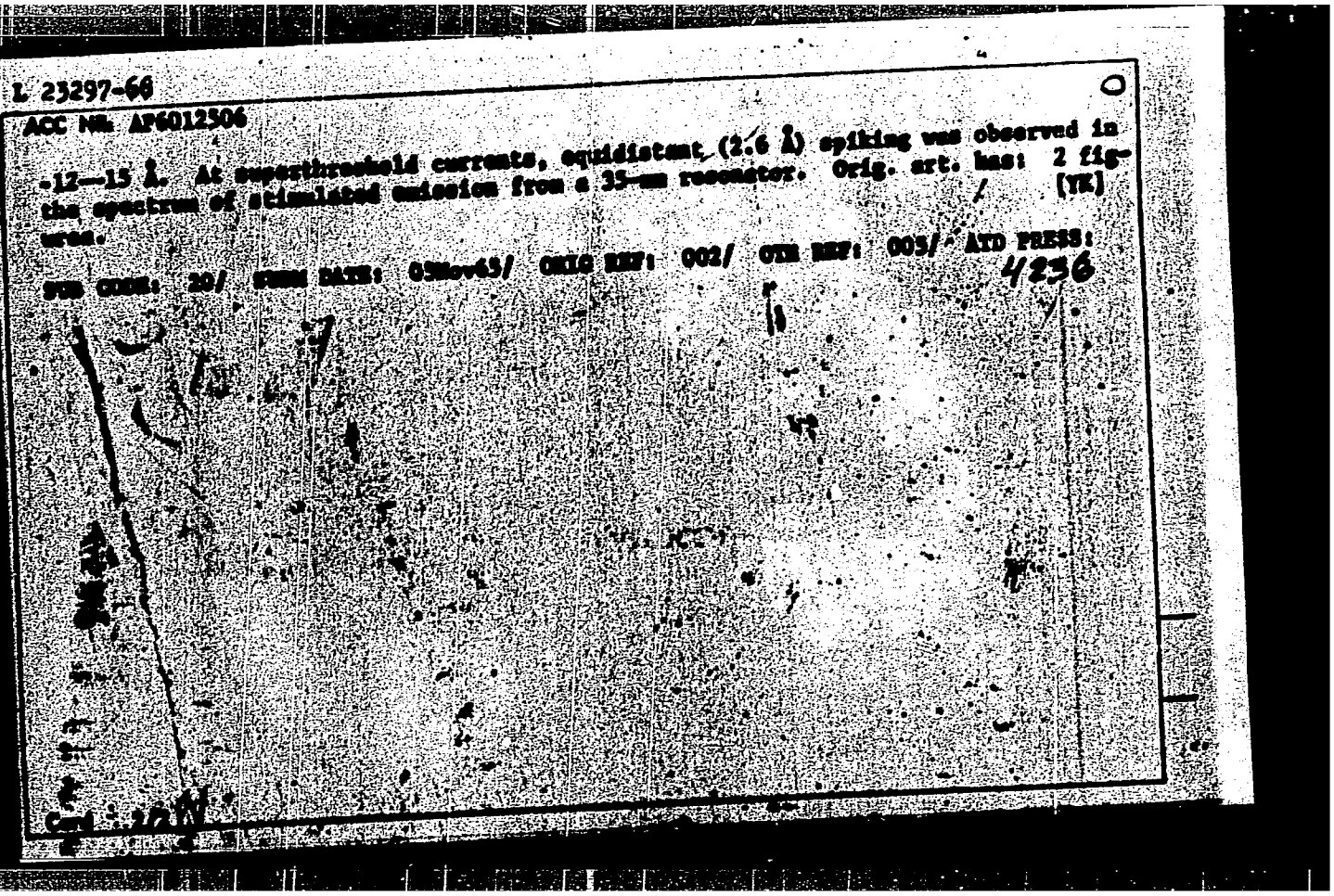
to deposition of thick GaP epitaxial layers [N. P. Sazhin, V. N. Maslov. DAN SSSR, 160, 171 (1965)]. The close-spaced system used in the present study was similar to that described by F. H. Nicoll [J. Electrochem. Soc., 110, 1165 (1963)]. The source material was a ground mixture of GaAs and GaP crystals, which was placed in a cavity on the surface of the lower graphite block. Water vapor carried by a stream of hydrogen was the transporting medium. The substrate was heated in a vertical resistance furnace to a maximum of 880C; the temperature gradient between the source and the substrate blocks was 10—20C. The growth rate was 7—15 μ/hr. Under the above conditions, the single crystal epitaxial GaP_xAs_{1-x} mirror-like layers, up to 700 μ thick and to 3 cm^2 in area, were prepared on (111)B GaAs substrate. Composition of the layers was dependent on the composition of the charge. Transport of components between the source and the substrate was accomplished in the 1:1 ratio, if the substrate was maintained at 872—875C. Therefore, a given ratio of the components could be obtained over the entire composition range of GaP_xAs_{1-x} solid solutions ($x = 0—1$). The problem was discussed of the application of this theoretically anomalous, transport of components to other semiconductor quasibinary systems. Orig. art. has: 1 figure. [JK]

SUB CODE: 20 SUBM DATE: 07Jun65/ ORIG REF: 003/ OTH REF: 017/ ATD PRESS: 4163

Card 2/2



L 23297-66 FBD/EWT(l)/EWT(m)/EEC(k)-2/T/EWP(t)/EWP(k)/EWA(h) IJP(c)
ACC NR: AP6012506 SOURCE CODE: UR/0181/66/008/004/1283/1285
AUTHOR: Yaliashev, P. Z.; Ismailov, I.; Mashal'shiy, A. Ye.; Ostrovskaya, V. Z. 47
ORG: Physics Institute im. P. N. Lebedev AN SSSR, Moscow (Fizicheskiy institut AN SSSR) B
TITLE: Coherent radiation of an indium arsenide-phosphide p-n diode
SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1283-1285
TOPIC TAGS: coherent radiation pn diode, indium arsenide, indium phosphide, solid state laser, infrared laser
ABSTRACT: InPAs crystals were obtained by two-temperature step-by-step synthesis (A. Ya. Mashal'shiy, Kyull. isobret., no. 12,40, 1964) in conjunction with oriented crystallization. Subsequent treatment of synthesized specimens (P = 94%, As = 6%) containing large (1 cm^3) seeds was similar to that used in the preparation of GaAs diode lasers. The diffusion of the acceptor impurity (Zn) from $ZnAs_2$ was carried out in a sealed tube at 750C during a period of 30 min. Fabry-Perot type resonators were used with distances between mirrors of 0.5 and 0.35 mm. Coherent radiation from these specimens was at 0.942 μ and the threshold current densities at 77K were from 2.5 to 6.0 × 10^3 amp·cm^{-2}. Line narrowing was observed at threshold currents (~300 amp·cm^{-2}) and at 1.5—2 times their value produced spectral widths of
Card 1/2



L 23297-66

ACC NR: AP6012506

-12--15 Å. At superthreshold currents, equidistant (2.6 Å) spiking was observed in the spectrum of stimulated emission from a 35-mm resonator. Orig. art. has: 2 figures. [YK]

SUB CODE: 20/ SUBM DATE: 03Nov65/ ORIG REF: 002/ OTH REF: 003/ ATD PRESS: 4236

Card 2/2

L 44600-66 EWT(1)/EWT(m)/EEC(k)-2/T/EWP(k)/EWP(t)/ETI IJP(c) WG/JD
ACC NR: AP6030959 SOURCE CODE: UR/0181/66/008/009/2610/2615

AUTHOR: Basov, N. G.; Yeliseyev, P. G.; Ismailov, I.; Yakobson, S. V.; Nashel'skiy, A. Ya.; Pinsker, I. Z. 66

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Certain properties of InP lasers

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2610-2615

TOPIC TAGS: solid state laser, semiconductor laser, indium phosphide laser, infrared laser, INDIUM COMPOUND, PHOSPHIDE

ABSTRACT: Stimulated emission of InP diodes in the 9060—9080 Å region was compared with that of their GaAs counterparts (see Table 1). InP bars were prepared by the directed crystallization method in the form of large-size polycrystals grained in the direction of the bar axis. The bars were tellurium-doped with electron concentrations of $5 \cdot 10^{17}$ cm^{-3}. The diffusion of zinc from the gas phase into polished plates each containing 2—3 seeds took place at 750C over a 30-min period. The depth of the p-n junction was 35 μ. The electrical contacts were made of gold which was sputtered on plates at 400C. The bar ends were polished and the sides were roughly worked. The GaAs diodes were prepared in a similar manner with the following exceptions: diffusion of zinc into GaAs lasted 4 hr at 850C under excess As pressure, and the resonator

Card 1/3

Table. 1. Basic characteristics of InP and GaAs lasers

	InP	GaAs
Electron concentration in the n-region, cm^{-3}	$5 \cdot 10^{17}$	$5 \cdot 10^{17}$
Electron mobility in the n-region, $cm^2/v \cdot sec$	2000	3200
Concentration of zinc in the gaseous phase during diffusion, cm^{-3}	$3 \cdot 10^{18}$	$7 \cdot 10^{18}$
Diffusion temperature, °C	750	850
Diffusion time, hours	0.5	4
Length of Fabry-Perot resonator, mm	0.8	0.9
Wavelength of stimulated emission, A	9070	8480
Threshold current density, amp/cm^2	7200	940
Threshold current density after one surface is silvered, amp/cm^2	4700	630
Loss factor α, cm^{-1}	8	8
Gain divided by current density, β, $cm \cdot amp^{-1}$	$3.7 \cdot 10^{-3}$	$2.5 \cdot 10^{-2}$

surfaces and diffusion plane were produced by cleavage along the contact plane. The diffusion depth in both cases was almost identical. As regards the width of directivity, InP lasers (5—7°) were shown to be superior to GaAs lasers (14—19°) by a factor of 3 or 4. InP laser diodes were characterized by a low loss factor ($\sim$7 cm^{-1})

L 44600-66
ACC NR: AP6030959

and a gain relatively lower than that of GaAs, expressed in a linear approximation as $k = 3.4 \times 10^{-3} j\ cm^{-1}$, where j ($amp/cm^{-2}$) is the current density. The latter can be due to a lower (than GaAs) quantum yield and to a thick active layer (8—10 μ). The differential efficiencies of the InP laser made it possible to deliver pulsed power of 7 watts at 75 amp at the liquid N temperature. Orig. art. has: 2 tables, 2 figures, and 3 formulas. [YK]

SUB CODE: 20/ SUBM DATE: 17Jan66/ OTH REF: 012/ ATD PRESS: 5078

Card 3/3

MASHEL'SKIY, A. Yu.

Model preparation for winter. Kinomekhanik no.11:17-18 N '53. (MLRA 6:11)
(Moving-picture projection)

[redacted]'SKIY, A. Yu.

District seminars of cultural and educational workers in the R.S.F.S.R. Kinomekhanik no.12:15 D '53. (MLRA 6:12)
(Motion-picture projection)

NASHEL'SKIY, Arkadiy Yuzefovich; STEPANCHENKO, Z.I., redaktor; BYSYMONT, [illegible], redaktor; ALEKSANDROV, V.I., tekhnicheskiy redaktor

[Organization and operation of motion-picture projectors in rural districts] Organizatsiia i ekspluatatsiia sel'skikh kinoustanovok. Moskva, Gos. izd-vo "Iskusstvo," 1955. 161 p. (MLRA 8:7)
(Motion-picture projection)

MASHEMPA, V.T.; LAKOMSKIY, V.I.

Analyzer of inert gas purity. Avtom.svar. 15 no.5:89-91 My '62. (MIRA 15:4)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni Ye.O.Patona AN USSR.
(Gases--Analysis) (Protective atmospheres)

YEGOROV, S.V.; BERNSHTEYN, A.V.; NASHIVANKO, Ye.M.

Effect of surface-active additives on the adhesion of asphalts to granite. Avt.dor. 21 no.9:10-11 S '58. (MIRA 11:11)
(Road materials--Testing)

YEGOROV, S.V.; NASHIVANKO, Ya.M.

Experience in organizing bases for making emulsions and black topping. Avt. dor. 22 no.5:7 My '59. (MIRA 12:8)
(Road materials)

AUTHORS: Nashivanko, Ye.M., Bernshteyn, A.V. SOV/80-32-2-37/56

TITLE: The Effect of Iron Salts on the Hydrophobization of Soils (Vliyaniye soley zheleza na gidrofobizatsiyu gruntov)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 2, pp 436-438 (USSR)

ABSTRACT: Hydrophilic soils cannot be used in road construction. Treatment with bitumen and tar increases their hydrophobic nature. The best effect is obtained by tri-valent cations, like iron salts, which affect the colloidal-chemical properties of the soils. The addition of iron salts reduces the quantity of bitumen necessary of hydrophobization. The iron sulfates and chlorides are by-products of the metal industry and the bromine plants.
There are 2 tables. and 5 Soviet references.

SUBMITTED: September 19, 1957

Card 1/1

BERNSHTEYN, A.V.; YEGOROV, S.V.; NASHIVANKO, Ye.M.

Manufacture and use of acid emulsions. Avt. dor. 24 no.7:16 Jl '61. (MIRA 14:7)

(Road materials)

YEGOROV, Sergey Viktorovich; NASHIVANKO, Yelena Mikhaylovna; BERNSHTEYN, Aleksandr Veniaminovich; KOVRYZHNYKH, L.P., red.; GALAKTIONOVA, Ye.N., tekhn. red.

[Pavements made with emulsions and a cation-active additive] Pokrytiia s primeneniem emul'sii i kationoaktivnoi dobavki. Moskva, Avtotransizdat, 1962. 25 p. (MIRA 16:2)
(Pavements)

BERNSHTEYN, A.V., kand.khim.nauk; NASHIVANKO, Ye.M., inzh.; KUCHMA, M.I., inzh.

Effect of fatty acids on the emulsification capacity of bitumens. Avt.dor.i dor.stroi. no.1:170-177 '65.
(MIRA 18:11)

ZAYTSEV, Kh.P., kand.ekonom.nauk; MASHKEVICH, I.Ye., kand.tekhn.nauk

Operational control and recording of automatic blast-furnace process. Mekh.i avtom.proizv. 16 no.12:47-49 D '62. (MIRA 16:1)

(Blast furnaces)

NASHKOV

NASHKOV, D., NASHKOVA, O.

Phosphatase system in Penicillium crustosum 1/3 E. Izv Mikrob. Inst., Sofia., Vol. 1, 1950. p. 205-12

1. (Dr. Dim. Nashkov--Head; Olga Nashkova--Assistant, Veterinary Institute for the Production of Sera and Vaccines.)

CLML 19, 5, Nov., 1950

NASHKOV D.

ANGELOV, S., PANAIOTOV, P., GRIGOROV, I., NASHKOV, D.

Experiences with production of streptomycin. Izv. mikrob. inst., Sofia. 2:83-88 1951 (CIML 21:3)

1. Professor Doctor, Academician for Angelov; Doctor for Panayotov and Nashkov.

NASHKOV

BULGARIA/ Microbiology. Microorganisms Pathogenic F-5
to Humans and Animals

Abs Jour: Ref Zhur - Biol., No 6, 1958, 24295

Author : Nashkov
Inst : Not given
Title : Obtaining of a Cardiolipin Antigen for Sero-diagnosis of Syphilis.

Orig Pub: Izv. Med. in-ti. B"lg. AN, 1956, 13, 421-429

Abstract: No abstract.

Card 1/1

USCOMM-DC-55, 214

NASHKOV, D.

"Metabloic Changes in the Brain Tissue Infected with the "H" Virus."

p. 381 (Izvestiia, Vol. 2, 1957, Sofiia, Bulgaria)

Monthly Index of East European Accession (EEAI) LC. Vol. 7, No. 11, Nov. 1958